

TIMELINEZ

VOLUME 5 ISSUE 4

APRIL 1987

\$1.00

THE JOINT NEWSLETTER OF THE THREE TIMEX-SINCLAIR
USER GROUPS IN THE SAN FRANCISCO BAY AREA
** EBZUG PUG SVSTUG **

**TIMEX/Sinclair Bulletin Board
in San Mateo!!! (415) 571-6911**

On March 25, 1987, the LogOn Unlimited Bulletin Board System (BBS) in San Mateo, California, initiated a new TIMEX/Sinclair Special Interest Group (SIG). This opens the door to the world of electronic data transfers without having to pay \$\$\$/hour service fees or call the ends of the earth!

Having a SIG in the San Francisco Bay Area will now make it economical to post our public domain software on a BBS so that, firstly, you won't have to bring all your hardware to our meetings and spend the whole time copying programs from the tape library and, secondly, there is finally a way for our many members who are not in the Bay Area to get access to these programs.

More importantly, I expect that the ability to upload files will bring in many, many new programs for the library. The first four files on the board were donated even before the instructions for the TIMEX/Sinclair section were posted! (Three of the four came in from other states!)

Presently, we will be handling programs for the TS2068, the Spectrum and the QL. In the near future we will be opening the files area for ZX81, TS1000, TS1500 software. The software will all be public domain, i.e., no copyright. That means you can download anything on the board free. Some of the material will be shareware. That means you can download it, try it out and if you like it, send the author some money. We'll usually post a "recommended shareware price" and whose program it is, and from that point on it's strictly between you and your conscience.

In addition to programs, also available will be text files such as technical data, program documentation, etc. There is a strong chance that we will soon begin using the SIG as the prime location to which TIMELINEZ articles will be submitted. (The articles themselves will probably not be posted on the board, but this will make it far easier to publish TIMELINEZ and probably improve its appearance. Desktop publishing lives!!!)

Other files to be posted will be run-length-encoded RLE files for graphics. The possibilities for additional types of files available are only limited by your imagination.

Besides the UL/DL files section, we also have our own message base (Message Base 10) for public messages. These can be electronic mail (EMAIL) addressed to individuals or notices/questions addressed to "ALL". What better way to ask everybody a question at once! There is also a way (Message Base 1) to send truly private EMAIL to any user on the BBS.

There are, of course, other SIGs on the board and other users of the system include: IBM-PCs, Commodores and Macintoshes.

The number of the LogOn BBS is: (415) 571-6911. This is within the San Francisco PC Pursuit area, so you out-of-state PCPers, go to it. Set your communication parameters to: Word 8, Stop 1, No Parity. There is no fee for using the system, but they request that users donate \$25.00 per year. This is a Non-Profit service, and the \$25.00, besides paying part of the operating costs of the system (8 phone lines - may go to 32 in the future, disk costs, etc., etc., etc.), will also allow you to have more time on the system each day as well as access to special features. The main special feature you may find useful is the "CHAT" mode, in which you can conference-type with other users in real time (ala CompuServe's on-line conferences)! We may even try to schedule some TS SIG conferences.

The first time you call, you fill out a short on-line form, including a permanent password (of your choice), and then you can check out/use the system. Shortly thereafter, you

(cont. 289)

TIMELINEZ IN TRANSITION
by George Hockridge

The next issue of TIMELINEZ was originally scheduled as an April/May edition. Walt Gaby, Managing Editor for the last two years, had planned to turn over his duties to Norm Lehfeldt upon returning from a well deserved vacation. Walt also planned to work with Norm on the next issue and show him the production ropes.

Meanwhile, down at the TIMELINEZ mailbox, the articles kept arriving at an accelerated rate so I volunteered to come out of retirement for one month and do an interim April issue. I don't have meeting dates for the South Bay or EBZUG at this time so check with the people listed on page 289. The PUG meeting will be held as scheduled on April 19th even though it is Easter. I hope you enjoy this bonus TIMELINEZ issue.

The ad stated: Advanced version of the T/S1000. Will run all prerecorded tapes for Sinclair/Timex 1000-ZX81. I ordered Feb 22 sent a money order for \$35.95 to American Design Components, 62 Joseph Street, Moonachie, N. J. 07074. And received the PC8300 on Mar 06. Today I sent in a money order for \$46.95 for another PC8300 plus a 16K Rampak.

Perhaps I'd best start with the physical dimensions of the PC8300. The box and the computer both are missing any markings to identify either the computer or the manufacturer. There is molded into the plastic case made "in Hong Kong". I suspect that it was to be sold and the seller would put on his trade mark and or model number. The computer case (cabinet) is dark ivory or beige and is made of plastic but it does not have any shielding whatsoever. The case disassembles by removing 3 screws and then prying the case apart. There are snap catches molded into the plastic that hold it together. When you lift the top and the keyboard you will find the cable (16 wire ribbon cable) that connects the computer and the keyboard and if you are carefull you can tilt the keyboard back and take out four screws to remove the computer board itself. The case is 11 5/8 inches long by 6 inches wide and 2 1/4 inches high.

The computer board is 10 1/2 inches long and 3 9/16 inches deep with a 7805 regulator heatsink (black) that sticks up 1 inch and is 3 7/8 inches long. The external bus connector is centered on the length of the computer board. The board has 4 spaces for sockets to be installed if you want to clean out the solder from the holes for 4 2114 RAMS. All of the chips except the RAM are mounted parallel to the length of the computer board. There was no attempt to crowd the circuitry to compact the board.

The keyboard has 42 keys including 2 SHIFT keys and a RESET and has a LED power on indicator. The keys have action similar to the T/S1500 but the keys are slightly larger. The RESET key is to the right of the 0 key and there is a shift key on either end of the bottom row with the SPACE key between the period key and the SHIFT key. You have to spell out almost all commands since there are only a few like SIN, LINE NO., and DELETE are given. The keyboard is mounted to the computer top cover with molded in snaplock fasteners so you can get the computer out for repair.

With the computer in working position all the ports are on the back side from left to right they are TV, JOYSTICK (9 pin socket) EXTERNAL BUS, MONITOR, MIC, EAR, and DC POWER. The DC Power plug is the kind that has a hole in the center and the power plug for T/S 2068 will fit A B S O L U T E L Y D O N O T T R Y I T! The reverse polarity will fry the 7805 regulator at the very least and damage other things too. More about that later. Like on the T/S1500 the closeness of the other ports will hinder the use of certain peripherals.

The computer has the following chips: Z80 CPU, c4005 (their version of a ULA), AMI 8444 AB ROM, TMM 2016 RAM, SN74LS05N, and of course the 7805 regulator. Only the 7805 and the 74LS05 are soldered in the others are all socketed. And while it isn't a chip the board has a speaker mounted on the near right hand end.

The external bus is given in the manual and in English and all the bus call outs are the same as for the ZX81, T/S1000 which I checked against one of my books.

I would have liked to give you a detailed tour of the keyboard but I pulled a bonehead. The power pack that came with my computer was to be used on 220 VAC so I was thinking and noticed that the power plug on my T/S2068 would fit. So I checked the polarity but I misread or crossed the VOM probes any way when I powered up nothing on the TV and I heard a faint buzzing and I turned off and shortly I smelled the scorched electronic parts. From that point on I have been slowly trying to get it up and running. The Z80 is ok it works on one of my T/S1000 and ditto for the RAM. I had no way for sure to check the ROM or the ULA so at that time I didn't.

I got the computer and keyboard out of the case and got the regulator out, cut leads and got the holes cleared of solder and got another regulator soldered in place and I rigged up a transformer with two 110 VAC primary windings and wired them up series adding and soldered that to the prongs of the 220 VAC power supply. I fired up the computer board with the chips out of their sockets and no smoke and LED lit up. Fine so I unplugged and plugged in the chips and with the computer board and keyboard loose on a wood surface I fired up again. Still no TV action but a transistor on the computer board cracked open and smoked. Now I need to find a MH9013 transistor or its equivalent. Either the reversed polarity caused the transistor to fail and to go when I powered up or else the the circuitry on the bottom of the keyboard touched something on the computer board and shorted out.

Now I am trying to find a replacement transistor and what I may have to do is to remove as carefully as I can the other MH9013 transistor and use a transistor checker to find out what it is NPN or PNP and maybe the gain and whatever else I need to know to find a replacement. A friend has told me that a 2N2222 or its compliment will very likely work. But before I try to remove the transistor I will see if it can be checked in circuit.

The PC8300 looks like an attempt to duplicate the T/S1000 with a similar but different enough to avoid lawsuits. The more I looked at the computer board the more I thought that the board was enough like the T/S1000 for the ROM and the ULA chips to work. I tried that and I may have blew the chips but I feel the pinouts are very likely the same. So I have ordered another PC8300 but I will be very carefull next time.

I had received a letter from a T/S friend the day after I received my computer and he stated that he had ordered one. And when I blew mine I called him up to warn him but he already had his up and running. He had ordered his with the 16K rampak and it all worked. The rampak looks like the Timex 1016 except it is white. His computer came with a 110 VAC power supply.

He tried to load in some programs and he found that all basic programs loaded all right but machine code puts the computer in a cycle printing out the last few lines of the program clearing the screen and repeating. and RESET would not stop or clear the program out of the computer, he had to pull the plug to get control again.

BUILDING A RS-232 PORT INTO THE 2050 MODEM

By Loren Latker

DISCLAIMER:

Neither this publication nor the author is responsible for any damage that may occur to your modem and/or computer if you attempt this project. Proceed at your own risk; and only if the warranty on the modem and computer have expired!

Zebra designed it: a small RS-232 circuit board to be added to the 2050 modem circuit board. The only drawback I could see to Zebra's kit was in not putting it inside the modem case.

Afterall, with an Oliger Mother board, printer interface, Disc boards, and the 2050 modem, my 2088 was taking control. Pfu! With having another modem, uncased or housed in some klunky box, adding to the clutter. I wanted something slightly smaller than my apartment, not larger!

Knowing a thing or two about switches - the common ordinary garden variety - I figured that with the simple addition of a 3PDT switch the whole Zebra Kit would fit inside the modem. The following is a step by step account of how I built the RS-232 circuit into the existing modem case with switch selectable RS-232 or modem functions.

The only deviation from the original Zebra kit instructions was that I cut off pins #3, #17 and #22 flush with the RS-232 PCB bottom and added some jumpers and the switch.

For the pins that go thru the RS-232 PCB I bought a couple 16 pin DIP Component Carriers from Radio Shack (part #276-1980), pulled the pins out and soldered them in the PCB.

Then on pins #3, #17 and #22 I cut off the bottoms. This left only the U shape section above for soldering jumpers to.

I made the trace cuts on the modem board wider than normal, and in an area where I could safely solder a wire to the trace. I added 9 jumpers. One each to pins #3, #17 and #22 of the 8251. One each to the traces that were cut - on the far side of the cut (opposite the 8251).

The final jumpers went to the tops of the header pins on the PCB (connected to IC 1, but cut off so no contact is made with the socket attached to the 8251). All the jumper wires go to a 3PDT mini switch. The diagram shows how to hook up the switch.

Next I drilled a hole in the modem case back panel (removable) and mounted the switch right next to power receptacle. I hard wired a ribbon cable directly into the PCB (see diagram) folded it over and ran it parallel to the modem cable for a bit - till it was outside the case area.

I purchased the lowest cost Break-out Adapter I could find (\$12.95 from Dick Smith Electronics: part #X-4000) and wired it up according to the modem eliminator configuration diagram.

Once everything was wired up I tested it. With the switch up

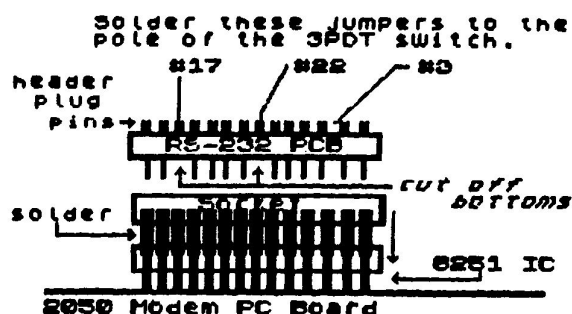
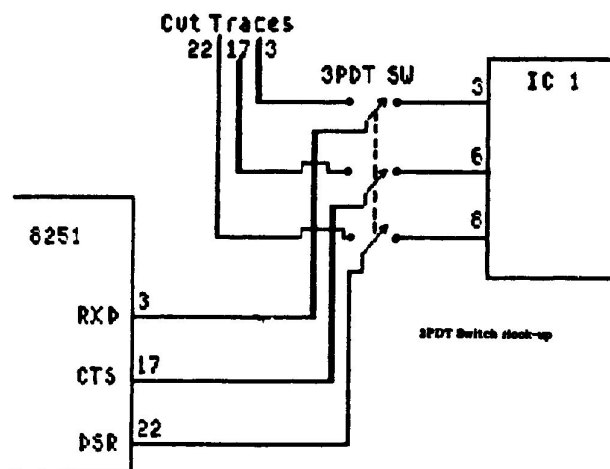


Fig. 1



Enlarged View of Pin Used

OPTION a=0
OPTION b=0
OPTION c=0
OPTION d=0
OPTION e=1
OPTION f=3
OPTION g=1
OPTION h=2
OPTION i=1
OPTION j=0
OPTION k=0

Memorywriter Communication Option Settings
To Allow Using The TS 2050 Modem/RS-232

RS-232 PORT (cont.)

the modem ran as intended. With the switch down the RS-232 port printed this article on the Xerox Memorywriter.

After checking all components I closed the modem case and glued the rubber feet back on (after testing the unit again in both modes). Worked like a champ and looks great; and it all fits inside without a problem. Now if someone will come up with the software to drive a printer all will be cool!

Speaking of software: to run the Memorywriter the following combination of basic lines from the Zebra article and the October 1985 issue of L.I.S.T. prints out on the Memorywriter; and will also load the file into the Memorywriter's memory without printing.

```
1 OUT 119.0: OUT 119.0: OUT 119.0
2 OUT 119.84
3 OUT 119.79
4 OUT 119.55
10 LET A=33280
15 ON ERR GO TO 80
20 PRINT CHR$ PEEK A: OUT 115. PEEK A
30 PAUSE 1.5
40 LET A=A+1
50 GO TO 15
80 ON ERR RESET : LET A=A+1
70 GO TO 15
```

This works very well indeed, if your format you lines to print out on the Memorywriter correctly: i.e. if you hit ENTER after each 80 characters or so. This with MSCRIPT. I have not tried working with Tasword II yet. The program will fill the screen and stop with "scroll?". Hit a key and you are on your way again. After the file is printed out the program will fill the screen with "?". These do not print out. If you must "break", "CONTINUE" will pick-up right where you left off.

I load the above program, then load the MSCRIPT "filename" CODE 33280 and run. Works like a charm!

Step by step:

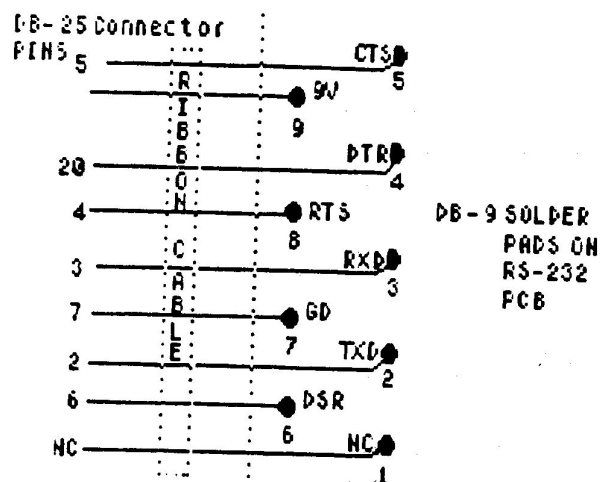
1) Follow the Time Designs article reprint and the two added instruction sheets. Insert pins in each hole of the RS-232 PCB. Turn the PCB over and solder them in place. Cut off Pin bottoms #3, 17 and 22.

2) Make sure that jumpers one and two are in place and that the resistor and caps are in the correct holes.

3) Widen the cuts you made on the traces and tak solder jumper wires to both sides of the cut. Actually, three jumpers can be soldered directly to the 8251 chip's pins 3, 17 and 22. Three other jumpers should be soldered to the far side of the cut traces.

STANDARD DIALBO RS-232C INTERFACE CABLE PIN ASSIGNMENTS

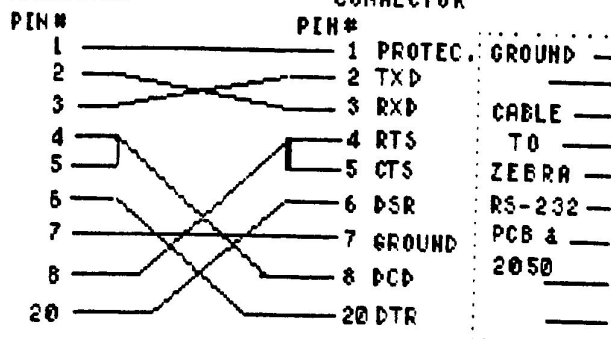
HOST	SIGNAL FLOW	PRINTER	SIGNAL
1	→	22	SIGNAL CHASSIS GRD
2	←	24	-TXD
3	→	48	-RXD
4	←	23	+RTS
6	→	49	+DSR
7	→	47	SIGNAL GRD
20	←	25	+DTR



BOTTOM VIEW RS-232 PCB (solder side)

XEROX MEMORYWRITER
CONNECTION: 25 PIN
FEMALE RS-232
CONNECTOR

EXTERNAL INTERFACE
CONNECTION: 25 PIN
FEMALE RS-232
CONNECTOR



MODEM ELIMINATOR CONFIGURATION

RS-232 PORT (cont.)

4) Solder jumpers to the tops of pins 3, 17 and 22 on the RS-232 PCB (the ones you cut off below).

5) I socketed IC's 1 & 2: there is room! By the way, I used the new DS14C88 and DS14C89 Quad CMOS Line Driver & Receiver chips rather than the typical LM1488 and LM1489 chips. The CMOS chips consume less power; and one of the problems I had with my modem after the RS-232 PCB was installed was heating up after a few minutes. That caused random characters to print out while on CompuServe and the inability to give commands. The CMOS chips seem to have fixed that.

A good source for those chips, and other odd parts, without a minimum charge is Hamilton-Avnet Electronics. They are all over California, and are also nationwide.

6) Mount the PCB in the 28 pin socket soldered on top of the 8251 chip. Make sure pin one mates to pin one, etc.

7) Solder the 3 jumpers coming from the 8251 chips pins on the underside of the modem board to the center contacts of a 3PDT miniature switch. I used color coded telephone type wire (That is a pair of wires will be coded so that one wire in the pair is white on green and the other wire will be coded green on white). Using such wire keeps you from hooking pin 3 to pin 17. However, any wire will do - even wire wrap wire; just make sure you wire pin 3 to pin 3 to pin 3 (8252 to switch to RS-232).

8) After all jumpers are soldered, drill a hole in the case back and mount the switch.

9) Separate the conductors of a length of 25 conductor ribbon cable and strip the appropriate ones depending on the printer you will be using. Wire those conductors directly to the PCB. Fold the cable back over the PCB and fold it again so that it parallels the modems' own cable. Wire tie the two cables together.

10) mount the modem board and close the case. Test the unit both before and after this step. The whole thing, switch, cables and extra board should fit in with room to spare.

See diagrams for switch hookup, modem eliminator wiring, etc.

Memorywriter Connector:

RS-232 PCB

Pins			Pins
1	Ground		NC
2	Transmit Data	TXD	2
3	Receive Data	RXD	3
4	Request to Send	RTS	8
5	Clear To Send	CTS	5
6	Data Set Ready	DSR	6
7	Ground		7
8	Carrier Detect		NC
20	Data Terminal Ready	DTR	4

1200-BAUD, 64-COLUMN TERMINAL PROGRAM EXPANDS VERSATILITY OF T/S 2068/SPECTRUM MACHINES

Pete Fischer

(Editor's Note: Pete Fischer is co-author of "The T/S Guide to Tele-communications." In V. 1.0 of that publication he wrote a less-than-glowing review of an earlier version of Specterm-64. Here are his second thoughts.)

Specterm-64 is widely used in England on the Spectrum. Version 4.1, distributed in this country by Grey & Clifford Computer Products, includes versions for the Spectrum and the 2068.

The big news here is 1200 bps on the 2068. It puts long-distance telecommunications in a new dimension - an XMODEM file transfer at 1200 bps takes 1/8 of the time of a HEX transfer at 300 bps!

The second big feature of this software is its versatility. It preserves a 7K BASIC area that is not part of its 31K+ file buffer -- the resident BASIC area is never overwritten as it is with MTERM. What good is this? One primary use is to interface the program with your own mass-storage system. It may also be used for BASIC auto-dialers, RLE decoders, auto-save routines, etc. All these utilities may be resident at the same time as long as the total space they occupy does not exceed 7K.

Routines used to implement such features are called "overlays." They were developed by CP/M programmers to allow easy modification of a program without divulging the source code. When you buy Specterm-64, you are buying the m/c kernel which implements the 64-column, 1200-bps features. But packaged with it as a demonstration and a convenience are some examples of overlays. Studying these will show you how to implement features which you may require in a terminal program.

This program generates 64-column output without hardware add-ons to your computer. It requires a monitor rather than a TV for readability, but dramatically increases the amount of information on the screen at any given time.

One feature I grew to like more and more during extensive testing of this program was the speed of the keyboard-scan routine. But for some it may be too fast. No problem -- it is easily adjustable.

It should be pointed out that the 1200 bps speed is not available if you are using the 2050 modem. For that you need an RS232 I/F and a conventional, stand-alone modem.

Specterm-64, V. 4.1 is available from the usual T/S dealers and directly from Grey & Clifford Computer Products, P.O. Box 2186, Inglewood, CA 90305.

MARCH PUG MEETING BRINGS TOGETHER NORTHERN CALIFORNIA TIMEX/SINCLAIR USERS

by Norm Lehfeldd

A well-attended, first-time joint meeting of Bay Area, Sacramento and San Joaquin Valley Timex/Sinclair Users Groups took place on March 15.

Joining the three Bay Area groups were chairmen Ed Burton of the Merced group and George Griffis of the Sacramento Group.

The possibility of a T/S Fest in the Bay Area in 1988 was discussed. Ed Burton has agreed to get information from Paul Holmgren and the other organizers of the May Fest in Indianapolis with a view toward plans for next year in S.F.

The start ups of the Merced Group's BBS, running on a 2068 using Ed Burton's modification of the I.S.T.U.G. BBS software (weekends at 209 384 3613) and the T/S S16 on the LogOn BBS in San Mateo (24hrs-7 days at 415 571 6911) which Pat Morrissey has implemented, were announced.

Bob Orrfelt demonstrated the current version of his corrected and updated 2068 EPROM.

The overflow crowd in Peninsula Hospital's Sierra Room demonstrated that interest in exploring all the possibilities of the Sinclair-based computers remains strong.

BBS (cont. from front page)

get a letter from LogOn with an access key-word (not your password), which you enter ONLY the next time you call back or if you ever have to re-register (if you don't call for a month or so, they wipe the non-paying users from the system - another advantage you gain for your \$25). The use of this letter/access key system is just to weed out the "fake" users and those who try to register with 37 different names just to get more time on the system! This is a fairly serious, computer user-oriented board without much in the way of "junk callers" and they aim to keep it that way.

In the near future it is also possible that the TIMEX/Sinclair files on the San Mateo board may be copied to other LogOn boards (presently there are two, one in Sunnyvale, CA, and one in Eureka, CA). We are still working on the details.

This is a great opportunity for the Bay Area TS user groups (and others) to conveniently handle our software libraries, communicate more effectively and perhaps ease the task of publishing TIMELINEZ. Our sincere thanks to the operators of the LogOn BBS, Dave Jones, Dave Hewes and John Navas, and to the Public Domain Software Exchange (PDSE) librarian, Bob Sullivan. Call in, use the board and, if you can, please donate to help keep this system on line.

And drop us a line in Message Base 10!

Pat Morrissey

E B Z U G EAST BAY Z80 USER GROUP
3128 KING STREET
BERKELEY, CALIFORNIA 94703
(Woody McPheeter's)

CONTACT: RUSS ENGLISH (415) 465-3116

MEETINGS: FOURTH THURSDAY OF EACH MONTH, 7:30 P.M.
WEST BRANCH LIBRARY
1125 UNIVERSITY AVENUE, BERKELEY

MAKE CHECK FOR DUES PAYABLE TO 'WOODY MCPHEETERS'.

P U G PENINSULA USER GROUP
311 NICHELLE LANE
DALY CITY, CALIFORNIA 94015
(415) 878-1773

PRESIDENT: GEORGE MOCKRIDGE

MEETINGS: THIRD SUNDAY OF EACH MONTH, 1:00 P.M.
PENINSULA HOSPITAL
1783 EL CAMINO REAL, BURLINGAME

MAIL DUES TO 'PAT MORRISSEY', 2000 CRYSTAL SPRINGS ROAD,
BLDG 21, APT 22, SAN BRUNO, CA 94066

S V S T U G SILICON VALLEY SINCLAIR TECHNOLOGY USER GROUP
6675 CLIFFORD DRIVE
CUPERTINO, CALIFORNIA 95014
(408) 253-3175

PRESIDENT: RITA CARR, (408) 738-2888, X-4579

MEETINGS: LAST TUESDAY OF EACH MONTH, 7:00 P.M.
(FOR LOCATION OF MEETINGS, SEE ACCOMPANYING
CALENDAR AND SVSTUG NEWS.)

MAKE CHECK FOR DUES PAYABLE TO 'SINCLINK'.

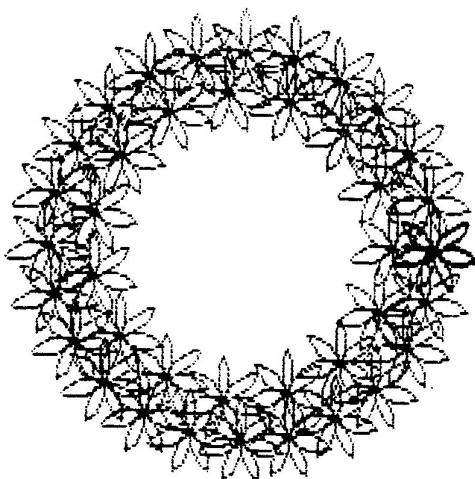
THIS TIMELINEZ NEWSLETTER IS A JOINT PUBLICATION OF THE THREE
TIMEX-SINCLAIR USER GROUPS IN THE SAN FRANCISCO BAY AREA.

NEW MEMBERS AND VISITORS ARE ALWAYS WELCOME.

FOR FULL MEMBERSHIP (WHICH INCLUDES PARTICIPATION IN GROUP
MEETINGS, THE TIMELINEZ NEWSLETTER, TAPE LIBRARY PRIVILEGES,
AND SPECIAL EVENTS), SEND \$15 ANNUAL DUES TO ONE OF THE ABOVE
ADDRESSES WITH THE CHECK MADE PAYABLE AS INDICATED.

FOR JUST AN ANNUAL SUBSCRIPTION TO THE NEWSLETTER, SEND A \$10
CHECK TO ONE OF THE ABOVE GROUPS.

To show you how much TIMELINEZ has helped me, I'm also enclosing "Garland", which was built on Oleg D. Jefimenko's article in the 4/86 issue, page 200. By initializing his figures I found a million ramifications. I can spend hours designing flowers of all shapes and sizes, and all those REMs help me use it for many other programs. By the way, I suggest SAVEing it with SCREEN\$, since it takes many minutes to form.



```
10 REM ..GARLAND
  ..LOAD "GARLAND"
15 REM ..WITH THANKS TO OLEG
  ..D. JEFIMENKO,
  ..TIMELINEZ 4/86,
  ..PAGE 200
20 REM ..BY GERTIE ANDERSSON
  ..10/85
25 REM ..THERE ARE 546 PIXELS
  ..IN A TRUE CIRCLE OF
  ..ANY SIZE
```

```
30 REM ..PRIME OR ODD NUMBERS
  ..BEST FOR F AND N
100 REM ..CIRCLE VARIABLES
110 LET X=128: REM H CENTER
120 LET Y=87: REM V CENTER
130 LET R=55: REM RADIUS
140 LET F=15: REM NUMBER OF
  FLOWERS WANTED
200 REM ..FLOWER VARIABLES
210 LET C=360: LET A=180:
  REM SHAPE OF FLOWER
220 LET HH=16: LET UV=16:
  REM LENGTH OF PETALS
230 LET P=.375*PI: REM CURVE
  OF PETALS
240 LET N=7: REM NUMBER OF
  PETALS
400 REM ..GARLAND
405 FOR K=1 TO 2: REM NUMBER
  OF CIRCLES
410 LET S=546/F: REM STEP FOR
  CIRCLES
415 LET SS=C/N: REM STEP FOR
  FLOWERS
420 FOR T=0 TO 2*PI STEP S/87
430 PLOT X+R*COS T/.82,Y+R*SIN
  T
440 FOR I=0 TO C STEP SS
450 LET H=HH*SIN (I*PI/A)
460 LET V=UV*COS (I*PI/A)
470 DRAW H/.82,V,P: DRAW -H/.82
  -V,P
480 NEXT I: NEXT T
500 LET R=R+15: LET F=F+9
550 NEXT K
```

FOR SALE:

2 2068 Computers, Power Supplies, Cords, Manuals

1 TS 2040 Printer with Power Supply

A&J Microdrives: 2 Interfaces, 2 Drives for small Wafers(A&J)

1 Drive for large Wafers(Entrepo), Assorted S/W

Tasman Parallel Interface..... \$150 for lot or Best Offer.

Howard Ballinger, 6251 Highland Ave., Richmond, CA 94805 237-0424 / 444-8891

MANAGING EDITOR: G. Hockridge

EDITORS: EDZUG John Ezike
PUG G. Hockridge
SVSTUG Bill Miller

ADVERTISING: Norm Leffeldt
Bill Strick

N/L EXCHANGE: G. Hockridge

ADVERTISING SCHEDULE:

Full Page \$40
Half Page \$25
1/4 Page \$15
1/8 Page \$10

TIMELINEZ
P.O. BOX 1312
PACIFICA, CA 94044
USA

First Class Mail